

DISCUSSION OF THE CLAIMS

Claims 1-17, 19-23 and 26-32 are pending in the present application. Claims 18 and 24-25 are canceled claims. Claims 31-33 are new claims. Support for new Claim 31 is found in the previously presented claims and the examples. Support for new Claim 32 is found in the examples and in the original claims. Support for new Claim 33 is found in the examples.

No new matter is added.

REMARKS

In a first Office Action after re-opening prosecution in response to a pre-Appeal Brief, the Office newly rejected the claims as anticipated over Yamanaka (U.S. 6,653,212). The Yamanaka reference was previously cited by the Office in support of a rejection of the claims under 35 U.S.C. § 103 which was withdrawn in response to the pre-Appeal Brief.

The Office alleges that the Yamanaka reference anticipates the present claims for at least two reasons. First, the Office asserts that Yamanaka's disclosure of a process for forming a thin film in a vacuum chamber by CVD processes anticipates the presently-claimed invention. The Office sets forth the basis for the rejection as follows:

When the substrate is silicon, with hydrogen as carrier gas and silicon tetrachloride as the material gas in the process of Yamanaka '212, trichlorosilane is formed, as evidenced by DeLuca '295 (note column 1, lines 31-44 especially reaction 1).

See the paragraph bridging pages 4 and 5 of the February 4, 2010 Office Action.

Applicants submit that the Office's assertions are incorrect, technically unfounded and unreasonable. The Office asserts that hydrogen is the "carrier gas". As previously pointed out, Yamanaka discloses that hydrogen is an inert gas in the Yamanaka process. Reaction (1) of DeLuca, on the other hand, requires that hydrogen participate in the reaction of silicon tetrachloride and silicon. Such participation in the reaction is inconsistent with the function of the inert hydrogen carrier gas described in Yamanaka.

The Office fails to reconcile the divergent disclosures of Yamanaka and DeLuca. Yamanaka explicitly discloses that hydrogen is an inert gas "for the formation of a film of Si and Poly-Si" (see column 48, line 53 of Yamanaka). The Office's citation to DeLuca makes no sense because the hydrogen in reaction (1) of DeLuca is not inert.

Moreover, the processes of Yamanaka and DeLuca are entirely different and contradictory. In fact, the process described in Yamanaka is one that forms a film of Si. In direct contrast, reaction (1) of DeLuca does exactly the opposite; namely, reacts silicon metal

to form trichlorosilane. The Office's rational for relying on DeLuca makes no sense in view of the fact that DeLuca's reaction (1) forms HSiCl_3 from Si whereas Yamanaka, according to the Office, forms Si from HSiCl_3 .

The rejection is further not supportable because it violates a basic principle of patent law. In order for the Office to show anticipation the Office has the burden of proving that all of the features of the present claims are disclosed in *one reference* (see MPEP §2131). Here, the Office relies on two references, i.e., Yamanaka and DeLuca, in violation of this basic premise of patent law.

The rejection is thus further unsupportable on legal grounds.

Irrespective of the above arguments, Applicants submit that at least Claims 19 and 20 are patentable over any CVD process disclosed in Yamanaka. Processes carried out at pressures of, for example, 1-10 bar are not CVD processes nor are they processes carried out in a vacuum chamber such as those of Yamanaka.

In an alternate basis for rejecting the claims as anticipated by Yamanaka, the Office asserts that Yamanaka's disclosure of a catalytic CVD method anticipates the presently-claimed invention. In this aspect of the rejection the Office relies on Rodgers in combination with Yamanaka to reject the claims as anticipated. As already explained above, the Office's reliance on a combination of publications to support an anticipation rejection is legally improper.

It appears that the Office relies on the Rodgers reference as evidence that any catalytic reaction occurring during the CVD (chemical vapor deposition) of the Yamanaka process inherently includes reaction of hydrogen with silicon tetrachloride to form trichlorosilane. Applicants submit the Office's assertion of inherence is not supportable.

The Rodgers process is substantially different from the process of Yamanaka. It does not matter that hydrogen and silicon tetrachloride react to form trichlorosilane in the Rodgers

process because this process is carried out under entirely different conditions than the process of Yamanaka. As admitted by the Office, the Yamanaka disclosure is relevant to a CVD process in which a thin film of, for example, silicon, is formed. The Rodgers process, however, as it is described with respect to the reaction of silicon tetrachloride and hydrogen, desirably does not form silicon. In fact, Rodgers even discloses that the ratio of silicon tetrachloride and hydrogen should be maintained such that the formation of silicon is avoided (see column 3, lines 32-37 of Rodgers). It is therefore readily evident that the Rodgers process is substantially different from the Yamanaka process. Such substantial differences contradict the Office's assertion of inherency. At best, Rodgers discloses that the reaction of silicon tetrachloride and hydrogen forms trichlorosilane in a process that is different from the Yamanaka process.

Applicants thus submit that the Office's rejections of the claims as anticipated by Yamanaka are not supported as a matter of fact or law and thus should be withdrawn.

Applicants draw the Office's attention to new independent Claim 32. The new independent claim is drawn to a process in which a mixture that consists of silicon tetrachloride and hydrogen is fed into a reactor to act as a reaction mixture. The reaction mixture forms trichlorosilane in the absence of any silicon metal. Applicants submit that new independent Claim 32 is further patentable over the cited art for the reason that the presence of silicon metal in any reaction mixture is not needed in order to carry out the formation of trichlorosilane.

In the alternate to the anticipation rejection, the Office rejected the claims as obvious over Yamanaka. Again, the Office asserts that the DeLuca and Rodgers references prove that trichlorosilane is inherently formed as an intermediate in the process of Yamanaka. As explained above, this assertion is factually erroneous and unsupportable in view of the cited references.

The Office's rejection of the claims as obvious over Yamanaka was addressed in Applicants' pre-Appeal Brief filed on October 13, 2009. The pre-Appeal Brief resulted in re-opening of prosecution, demonstrating that the Office's basis for rejection the claims as obvious over Yamanaka was not supportable. The Office's present rejection of the claims as obvious over Yamanaka amounts to nothing more than an unsupported conclusory statement that appears to entirely ignore the Office's previous withdrawal of such a rejection in view of Applicants' arguments of the pre-Appeal Brief.

The Office further rejected the claims as obvious over JP 57-118017 ("JP '017"). The Office concedes that JP '017 does not disclose the use of a metal heating element. The Office cites to Roewer (U.S. 5,716,590) as evidence that metal-containing catalysts can be used to hydrodehalogenate silicon tetrachloride in the presence of hydrogen to form trichlorosilane. Applicants draw the Office's attention to Claim 33 which recites a metallic heating element.

Applicants point out that Roewer does not disclose a heating element that is made of any of the metals described in the present claims. Instead, Roewer describes a catalytically active material "comprising silicon and at least one transition metal" (see column 1, lines 47-49 of Roewer). Roewer does not disclose the use of the heating element described in the present claims. The Office's assertion that the catalytically active material of Roewer is in similar to the heating element of the present claims is unsupportable as a matter of fact, i.e., for the reason that there is no evidence of record indicating that this material can function as a heating element.

The Office further asserts that the catalyst in the JP '017 process "is analogous to" the catalyst in Roewer. The catalytically active material in the JP '017 reference is not a heating element. This is readily evident by the explicit disclosure of the English Abstract of JP '017 which describes carrying out a reaction in the presence of a graphite resistor, e.g., a heating element made from graphite. Applicants submit that a graphite heating element is the

opposite of a metal heating element such as that described in the present claims. The Office's assertion that the present claims are obvious over the combination of JP '017 and Roewer fails to take into account the requirement of the present claims that the hydrodehalogenation reaction is carried out by contacting a reaction mixture with a heating element made of metal. The rejection in view of JP '017 in Roewer is thus not supportable.

Applicants this respectfully request withdrawal of the anticipation and obviousness rejections of the February 4, 2010 Office Action.

The Office objected to Claims 27 and 28 for failing to comply with the written description requirement. The Office set forth the following basis for the rejection:

There is no sufficient support in the instant specification for the product mixture "comprises HSiCl_3 ". It should be noted that in the instant claims, the "comprises" or "comprising" does not exclude the presence of silicon, and as evidenced by DeLuca (5,910,295), silicon tetrachloride can be converted into trichlorosilane without forming hydrochloric acid (note reaction 1 in column 1). From the reactions 1-4 in DeLuca '295, the hydrogen and chlorine are merely carriers (note column 1, lines 35-44).

See page 2 of the February 4, 2010 Office Action.

The Office's basis for rejection the claims for failing to comply with the written description requirement makes no sense whatsoever. DeLuca's disclosure is not relevant to the determination whether Applicants described the subject matter of Claims 27-28 in such a way to convey to those with skill in the art that the inventors were in possession of the claimed invention at the time the application was filed.

Perhaps it was the Office's intention to assert that the examples of the present specification (i.e., a description of the reaction of hydrogen and silicon tetrachloride to form trichlorosilane) do not concurrently form HCl . It appears that the Office believes that reaction (1) disclosed at line 31 of DeLuca supports such an assertion. Applicants point out that reaction (1) of DeLuca is not a hydrodehalogenation. Instead, reaction (1) on line 31 of column 1 of DeLuca is a "hydrochlorination". The Office offers no reason why a

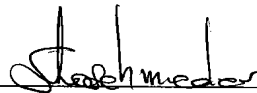
hydrochlorination reaction is in any way similar to or relevant to a hydrodehalogenation reaction.

Further, Rodgers discloses that the reaction of silicon tetrachloride and hydrogen produces a mixture of trichlorosilane and hydrogen chloride (see column 3, line 12 of Rodgers). Applicants thus submit that those of ordinary skill in the art would readily recognize that the reaction of hydrogen and silicon tetrachloride recited in the present claims and described in the examples concurrently forms hydrogen chloride. Applicants request withdraw of the rejection.

For the reasons discussed above, Applicants submit that the rejections are not supportable and should be withdrawn. Applicants respectfully request the mailing of an Notice of Allowance.

Respectfully submitted,

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